Laparoscopic Ventrar Rectopexy (LVR)
What the radiologist needs to know!

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Introduction

Laparoscopic Ventral Rectopexy (LVR) is commonly used in the treatment of rectal prolapse. Concerns have been raised about the potential risk of mesh complications after LVR. Both synthetic and biological meshes have been used as grafts.

Radiological imaging can be used pre-operatively to identify patient suitable for LVR. Post-operatively radiological imaging can assess normal placement of mesh, potential complications and therefore guide future management. Complications could present acutely or years later.
**Indications for LVR**

- LVR is indicated in patients with:
  - Overt rectal prolapse (Extra anal prolapse)
  - High grade internal rectal prolapse/intussusception
  - Rectal prolapse with middle compartment prolapse

- Patients presenting with rectal prolapse may report symptoms of:
  - Obstructive defecation syndrome (ODS) (difficulty evacuating or emptying rectum)
  - Tenesmus (sensation of incomplete evacuation)
  - Faecal incontinence (Involuntary loss of faeces)

*(Franceschilli, L. et al, 2015)*
Rectal Prolapse can be graded using the Oxford Prolapse Grade (Collison et al, 2009) using images obtained through defecating proctography.
Investigation to assess rectal prolapse

- Rectal examination
- Examination under anaesthetic
- Defecating proctography
  - Can identify:
    - Overt rectal prolapse
    - Intussusception
    - Rectocele
    - Involuntary loss of faeces
    - Perineal descent
    - Non-relaxation of puborectalis
Defecating Proctography

- Can be performed under fluoroscopy or with dynamic Magnetic Resonance (MR) imaging

- Defecatory phases essential
  - 37% rectocele, 40% enterocele, 28% intussusception only found in defecatory phase imaging
  - (Flusberg et al, 2011)
# Fluoroscopy vs MR

<table>
<thead>
<tr>
<th>Fluoroscopic DP</th>
<th>MR Proctography</th>
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<tbody>
<tr>
<td>Availability</td>
<td>Global assessment of all compartments of pelvis</td>
</tr>
<tr>
<td>Cheap</td>
<td>Excellent contrast resolution for soft tissues</td>
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<td>Assessment is physiological “sitting” position</td>
<td>Cross sectional &amp; multiplanar imaging</td>
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<td>Superior rectal emptying and therefore increased sensitivity to detect abnormalities of the rectum</td>
<td>Allows accurate measurements of organ prolapse</td>
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<tr>
<td>But</td>
<td>But</td>
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<tr>
<td>Radiation Exposure</td>
<td>Lower sensitivity of diagnosing intussusception</td>
</tr>
<tr>
<td>Limited assessment of posterior compartment</td>
<td>Performed supine position</td>
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<td></td>
<td>Costly</td>
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*(Foti et al., 2013; Kelvin et al., 1999; Pilkington et al., 2012)*
Selection criteria for LVR

- Indication
  - Symptomatic Grade III, Grade IV Rectal Intussusception
  - Grade V or overt rectal prolapse
  - Concomitant middle compartment prolapse

- Relative Contraindications
  - Previous CVA
  - Previous abdominal surgery with unfavourable adhesions
Fluoroscopic defecating proctography showing patient with intra-anal intussusception (↑) & rectocele (↓)
Fluoroscopic Imaging of patient showing Intra anal intussusception (A) shown extending into overt rectal prolapse in (B) during defaecatory phase of proctogram.
MR proctographic imaging of a patient at rest (A) and during defaecation (B). Note three compartment prolapse with cystocele ( ), uterine descent ( ) and rectocele ( ). Note also the presence of intrarectal mucosal prolapse during the defaecatory phase. Pubo–Coccygeal line ( ).
Synthetic Meshes

(PFMMedical, 2015)
Biological Mesh

(Cook® Medical, 2015)
Surgical Procedure

- Patient position – Reverse Trendelenberg
- Urinary catheter, IV Abs, VTE Prophylaxis
- 3 laparoscopic ports used
- Sacral promontory exposure
- Division of pelvic peritoneum from sacral promontory to right rectovaginal plane
- Rectovaginal plane dissected to pelvic floor
- Mesh secured to anterior rectal wall with soluble sutures
- Mesh stapled to sacral promontory (tension free)
- Peritoneum closed over mesh
Normal post-operative appearance

MR images of normal placement of mesh following LVR
Complications

Our centre, University Hospital of South Manchester has a specialist pelvic floor service. As well as complications we have experienced with our own patients, we receive tertiary referrals from other centers for patients with LVR/mesh complications.

Complex patients are discussed at a monthly pelvic floor multidisciplinary team.
## Complications (Early & Delayed)

<table>
<thead>
<tr>
<th>Mesh Related</th>
<th>Non-Mesh Related</th>
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<tr>
<td><strong>Early</strong></td>
<td><strong>Early</strong></td>
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<tr>
<td>◦ Infection</td>
<td>◦ Bleeding</td>
</tr>
<tr>
<td>◦ Rectal perforation</td>
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<tr>
<td><strong>Delayed</strong></td>
<td><strong>Delayed</strong></td>
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<tr>
<td>◦ Mesh Erosion</td>
<td>◦ Small Bowel Obstruction</td>
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<tr>
<td>◦ 2.4% synthetic mesh, 0.7% biological mesh</td>
<td>◦ Adhesional or internal hernia</td>
</tr>
<tr>
<td>◦ Median time to erosion 23 months</td>
<td>◦ Recurrence of prolapse</td>
</tr>
<tr>
<td>◦ (Evans et al, 2015)</td>
<td></td>
</tr>
<tr>
<td>◦ Vaginal erosion</td>
<td></td>
</tr>
<tr>
<td>◦ Rectal erosion</td>
<td></td>
</tr>
<tr>
<td>◦ Rectovaginal fistula</td>
<td></td>
</tr>
<tr>
<td>◦ Perineal Erosion</td>
<td></td>
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<tr>
<td>◦ Recurrence of prolapse</td>
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</table>
(A) Early Post-operative complication. Large Pelvic Haematoma (↓).

(B) Resolving haematoma (✔)
- No sepsis
- No fistula
- Full resolution of symptoms at 6/12 FU
- (➡) represents the mesh
Patient presented to ER following LVR at another hospital, with symptoms of increasing abdominal pain and distension since surgery. CT imaging 4 weeks post-LVR. (A) Showing dilated oedematous obstructed closed loop of small bowel (🟥).

(B) Demonstrating adhesional obstruction close to the mesh insertion site at sacral promontory (🟥).

(C) Highlighting the mesh fixation site (🟥) to the sacrum. Note the reactive ascites.
Complications
Rectovaginal Fistula after mesh Erosion & Extrusion

MR images in axial (A), sagittal (B) and coronal plane (C) showing the site of recto-vaginal fistula (↘️) secondary to mesh erosion and extrusion. (↙️) represents the gas filled vagina, (➡️) represents the rectum.
Complications
Recto-vaginal Fistula after mesh Erosion & Extrusion

Images represent the extruded mesh.
Rest (A) and Defecatory phase (B) during dynamic MR Proctography showing formation of intra rectal prolapse (📍), cystocele(📍) and rectocele(📍). Note the presence of perineal descent in A & B. Patient had a previous LVR at another center and presented to UHSM with recurrence of obstructive defecation symptoms. Pubo–Coccygeal line (——).
Complications
Late Recurrence with Mesh detachment: Case 2

MR Proctography in a different patient showing patient at rest (A) and during defecatory phase (B). Note 3 compartment descent in (B). (C) Coronal image shows detached mesh (↖) in the right side of the pelvis. Pubo–Coccygeal line (——).
Complications
Detachment of mesh & tethering to small bowel

MR Images (A) Axial & (B) Coronal showing detachment of mesh in a patient 10 months post–LVR. Note the loose end of mesh tethered to the small bowel (>).
MR images (A)(B)&(C) showing a patient who has undergone LVR presenting with ‘low take off’ recurrent, symptomatic mucosal prolapse (🟥) below mesh attachment to the rectum. Note normal placement of the mesh(🟥).
Laparoscopic Ventral Rectopexy (LVR) is commonly used in the treatment of rectal prolapse.

- However, there are risks from using mesh in the pelvis.
  - Mesh complications occur in 2% of cases.
  - Mesh complications may occur early or late.

Laparoscopic Ventral Rectopexy is safe.
Conclusions

- Radiological Imaging with proctography is essential in the assessment of patients pre-operatively.

- MR imaging is most useful in assessing post-operative complications.

- Dynamic MR proctography is essential in patients presenting with recurrent prolapse after surgery.
References


